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OCCASIONAL PAPERS OF THE NEW YORK ACADEMY OF SCIENCES
No. 1, pp. 1–12

Editor, EDMUND OTIS HOVEY

REVISED MINUTES OF THE SPECIAL MEETING OF THE COUNCIL

HELD 19 NOVEMBER, 1912

BY

EDMUND OTIS HOVEY, RECORDING SECRETARY

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NEW YORK ACADEMY OF SCIENCES

REVISED MINUTES OF THE SPECIAL MEETING OF THE COUNCIL HELD 19 NOVEMBER, 1912

A special meeting of the Council of the New York Academy of Sciences was called to order at the Union League Club at 8:30 p. m. on 19 November, 1912, President Emerson McMillin presiding and the following other members of the Council present: Messrs. Chas. P. Berkey, Franz Boas, N. L. Britton, J. McKeen Cattell, Jonathan Dwight, William K. Gregory, James F. Kemp, W. G. Levison, F. A. Lucas, William Mansfield, T. H. Morgan, H. F. Osborn, C. L. Poor, E. B. Southwick, R. W. Tower, C. C. Trowbridge, Clark Wissler, J. E. Woodman, R. S. Woodworth and E. O. Hovey.

On call by the President, the Recording Secretary stated that the meeting had been assembled in consonance with the vote passed by the Council at its regular meeting on 4 November for the purpose of considering the reports of the sectional committees on the conditions prevailing in the various sections and of considering the best plans to be adopted for the future work of the Academy. The Secretary further stated that these reports had been manifolded and distributed to all the members of the Council, together with a tabulated statement of the receipts, expenditures, property and membership of the Academy for twenty years (1892-1911 inclusive).

The President then called upon the members present to state their opinions regarding the present condition of the Academy and their recommendations as to its future, as follows:

Professor Charles Lane Poor: Attendance at the meetings of the Section of Astronomy, Physics and Chemistry is discouragingly small, often not more than one to three in addition to the officers. The competition of the Chemists' Club and the Physicists Association is such as to draw away to those organizations all the actual workers and students in their sciences. The number of astronomers is very small. The attendance at popular scientific lectures has been good, but the regular stated meetings are a failure. The speaker recommended that the Section be allowed to disband.

Professor J. McKeen Cattell remarked that the psychological division of the Section of Anthropology and Psychology held three good meetings

each year, which was largely due to the affiliation with the New York branch of the American Psychological Association. There were afternoon and evening sessions, with an intervening dinner, and psychologists were usually present from neighboring cities and universities. A good special meeting can be held if there are a dozen or score of men interested in the same line of work ready to present papers and to be present at the meetings, but groups of specialists of this character should be brought in contact with other groups and with those who are not scientific experts. This is a special function of the Academy. It would consequently be desirable to hold several meetings in the course of the year which would be of interest to all men of science and to those not professionally engaged in scientific work.

Professor N. L. Britton was called upon, but yielded his place to Mr. Wallace Goold Levison as being a member of the Lyceum of Natural History and antedating any person present in seniority of membership.

Mr. Wallace Goold Levison, with permission of the President, read the following paper which he had prepared for the occasion:

Mr. President and Members of the Council:

I have been a member and attended and presented papers at the meetings of the New York Academy of Sciences since 1872, when it was known as the Lyceum of Natural History of New York. The first of my papers before the Lyceum of which I have a record was read November 11, 1872, and described a new connector for volta-electric instruments. My second paper before the Lyceum, a note on the production of ammonia in nitric acid batteries, was presented March 10, 1873, and later published in the Journal of the Franklin Institute and the Proceedings of the Lyceum for 1873–1874. In 1874 a list of papers I had read was given in the Proceedings of the Centennial of Chemistry at Northumberland, Pa., and I have presented many subsequently.

From an experience in investigation extending over this series of years and my acquaintance of like duration with the Academy, I may now say that the present attendance at its meetings averages quite as well as it ever has in its history. It has always seemed to me that the Academy would fulfill its mission if its only aim were to be a Society of Record, in which case attendance at its meetings would be a minor consideration. Since the Royal Society of London and the Academy of Sciences of Paris have become each in its own country of national and as well of international importance, primarily as societies of record, there appears to be no reason why the New York Academy of Sciences should not enjoy a similar distinction at home and abroad. For this purpose the attendance of a quorum only at its regular meetings is sufficient.

Perhaps the chief energies of our management should be expended in this direction, although it might be desirable, as in the case of the Royal Society, for our Academy to occasionally, as it now does, conduct courses of lectures, exhibitions, receptions and other functions designed to acquaint the public with the more recent results of scientific development.

According to a history of the Royal Society of London in the Annual Report of the Smithsonian Institution for 1863, an autographed copy of which was presented to me by Professor Joseph Henry in 1865, "the advancement of Science has been signally indebted to three modern associations: the Accademia del Cimento at Florence, established in 1657, but which endured only a short time; the Royal Society of London, the establishment of which is referred to the year 1660, and the Academy of Science of Paris, referred to the year 1666. The chronological origin of the two latter organizations is, however, involved in some obscurity owing to their previous existence as private and spontaneous reunions of certain learned men of the age. Hence the title of 'The Invisible College' was applied by Boyle to the Royal Society while it existed in this inchoate state."

At a later period in its history the Royal Society appears to have encountered the same difficulty with which certain sections of our Academy contend, namely: a deficiency of papers, and a curious attempt was made to remedy it by the adoption of a resolution "that such of the fellows as regarded the welfare of the Society should themselves entertain it once a year with a philosophical discourse grounded upon experiments made or to be made; and in case of failure to forfeit five pounds. The same regulation was at the same time made an imperative obligation upon each member of the Council." Such attempts to force or exact scientific discoveries simply to supply programmes for meetings were and would be naturally futile.

The suggestion made in the report of our Section of Physics that no stated meetings be held in the future emphasizes this point. The stated meetings require that new material be developed to supply them with programmes.

I have often thought that perhaps meetings other than business meetings might to great advantage be called only upon notice to the secretaries of papers ready for presentation. That is to say, after some person, whether a member or not, has notified the Secretary of some matter he desires to submit to the Academy. This system would be in line with that of the publication of the Astronomische Nachrichten. We might have several meetings in one month and none in another, as might be expedient.

I am not acquainted with all the details of the origin of our Academy, but at the early period when I became associated with it it seemed to have had a better directed and more promising infancy than either of its renowned rivals of the old world—its sponsors having the previous experiences of these societies as a guide.

Certainly its members aimed to promote it to an ambitious career of more than local efficiency when on January 5, 1876, they merged the Lyceum of Natural History into the New York Academy of Sciences.

Had investigators been encouraged in this country as kindly as they are abroad by the societies under consideration, probably our Academy would have had the credit of recording the discoveries in this country of some of the chemical elements and developments in Physics which have glorified the records of these several foreign societies.

From the original charter and constitution of the Lyceum of Natural History of New York of the year 1867 it would appear that its sponsors had in mind the establishment of a Museum of Natural History and a working or reference library and for many years accumulated specimens toward the proposed Mu-

seum which, I believe, were destroyed by fire. It also accumulated a quantity of books and proceedings of societies which perhaps escaped in part or entirely the fate of its specimens and may form part of the present library of the Academy. It also appears that at one time the Lyceum occupied a building of its own on Broadway.

When on January 5, 1876, the name of the Lyceum was legally changed to The New York Academy of Sciences a new constitution was adopted. In this constitution a Museum is repeatedly mentioned, to be a prominent feature of the activities of the Academy.

It is much to be regretted that the Academy has been unable so far to acquire a building of its own as again proposed a few years ago to carry out the aims of its original charter and to accommodate its affiliated societies.

For many years I have hoped to see the Academy housed in such a building under its own control, scientifically constructed, provided with laboratories supplied with apparatus at the disposal of its members desirous of pursuing investigations, and also including a museum of apparatuses used in discovery investigations in all branches of Science. No such museum as this exists in this country to my knowledge, unless it be the model room of the Patent Office or the separate repositories of the instruments of Franklin, Priestly, Henry. Morse and others. A temporary exhibit of such apparatuses collected from various more or less obscure repositories was achieved some years ago by the South Kensington Museum, and the circumstance that the explanatory lectures which accompanied it, given by various experts, are yet frequently consulted in our public libraries shows that its influence still prevails.

There should certainly be a permanent and an accessible public repository for the apparatus used in discovery investigations. Perhaps the Academy might advisedly devote its energies to the achievement of some of the purposes thus suggested by the histories of its older rivals, which would serve in the future as in the past for incentives to scientific developments of ever progressive importance.

In concluding these remarks I may say that certain objections to the present home of the Academy perhaps largely account for the limited attendance at its meetings. The first of these is, of course, the well-known defective acoustics of the meeting room. I have again and again concluded that it was useless for me to attend the meetings, as I am able to distinguish little that is said except by exceptional speakers; yet in this room to-night I have distinguished all that has been said. Furthermore, the illumination is wholly inadequate for the exhibition of specimens or the use of microscopes.

A less important feature is the inaccessibility of the Museum to residents of the Boroughs of Brooklyn, Queens, Richmond and suburban towns. When the Academy met in Hamilton Hall, Columbia College, in 47th Street, and later in a buiding in 31st Street near 6th Avenue, it was more fairly convenient for residents of all the Boroughs, and its meetings were perhaps better attended. These objections are largely offset by the advantages of our present home, but the matter of acoustics of the room is a serious one.

The speaker then remarked that he had been pretty faithfully attending the meetings ever since becoming a member, and that, according to his recollection, the attendance was about the same now as in the earlier days.

Professor N. L. Britton asked whether it would not be well to plan for meetings of the Section of Astronomy, Physics and Chemistry only when matter appears that is desirable for use.

Professor Poor replied that there was no deficiency of papers, but that there was great deficiency of audiences.

Professor Britton then asked about the meeting room of the Academy.

Professor Osborn replied by exhibiting plans which had already been approved by the Trustees of the American Museum for the central pavilion of the Columbus Avenue side of the Museum building. This pavilion at the foot of West Seventy-ninth street simply awaits appropriation for construction by the city. The provisions for the Academy are a well-designed auditorium seating three hundred persons; also, on the floor below, a convenient, moderate-sized room for social gatherings and small meetings, together with small communicating ante-room.

Professor Britton then spoke upon the desirability of the Academy's going beyond the scientific meetings which have been held so long, its publications and its occasional small grants in aid of research, and entering into a field of active investigation, centering its energies on some one enterprise for a time, and then upon another. He suggested the exploration of some limited region as to all features of its natural history, say, for example, the making of a physical and natural history survey of Porto Rico, the present knowledge of that island being extremely limited, and submitted the following outline of a plan:

Proposed Physical and Natural History Survey of Porto Rico

Geological, physical, botanical, zoological, ethnological.

To be referred to a committee to consist of Professors Kemp, Poor, Britton, Lucas and Boas.

This committee to have power to arrange for exploration, observation, study and the preparation of manuscript, looking toward the publication of a physical and natural history of Porto Rico, and to expend a sum not to exceed $2,000 annually for four years from the Academy's funds, and also have authority to obtain additional funds by subscription or otherwise and to enlist such co-operation as they may deem desirable.

The committee also to have power to dispose of collections made or obtained after or during the preparation of a series of volumes describing the physical and natural history of Porto Rico, for which six volumes of the Academy's Annals are to be reserved at such time as manuscripts are made ready for publication, the volumes of Annals thus reserved to be published in sufficient editions to permit their sale as a set or as separate volumes, without detriment to the regular edition.

All investigators participating in this work should be required to report to the several sections preliminary results reached from time to time, and the Academy should also be kept informed of its progress by public lectures.

Permission should be granted to participators in the investigation to publish preliminary results and communications from time to time in any manner they may desire, with the approval of the committee in charge.

To inaugurate this investigation, a Porto Rico symposium is proposed, at which the members of the committee would discuss our present knowledge of the several topics involved and indicate the most efficient methods of broadening present information.

Professor Franz Boas said that the Academy ought not to try to keep up meetings for which there was no demand, and that for this reason the freedom of meetings asked for by Vice-President Poor seems desirable. He referred particularly to the publications of the Academy, pointing out the difficulties inherent in a general series of scientific publications at a time when the general trend of scientific publication was towards specialized journals, and he suggested the desirability either of working towards co-operation with other similar academies in the hope of ultimately establishing a number of independent series, each devoted to a special science, or of co-operating with existing journals. He hesitated to accept the scheme of work in Porto Rico suggested by Professor Britton, because he doubted that the Academy would be able to administer the collections obtained, and that it could not carry through work of this kind as well as scientific institutions like the Botanical Garden or the American Museum of Natural History, which were organized for this purpose. He thought, however, that co-operation with such institutions might be well worth considering.

Professor William Mansfield gave it as his opinion that the members of the Academy should be missionaries of science in their own particular fields; that the educational work of the Academy was of great importance, and that social meetings with discussions were desirable.

Mr. Levison was given the floor for the second time and spoke of the natural history survey of Long Island now being carried on by the Brooklyn Institute of Arts and Sciences as being indicative of what can be done by a private scientific society.

Professor J. E. Woodman, referring to a remark made by the previous speaker, said that although the acoustics of our present meeting room were bad, this matter was a large problem not to be settled in an offhand manner. He then yielded the floor to Dr. Southwick.

Dr. E. B. Southwick expressed the opinion that the Academy's meetings were too exclusive; that we should try to get others into the meetings with specimens and with items of general interest. He was in favor of broadening the scope of the Academy's work and making it more popular in character.

Dr. Jonathan Dwight spoke of the lack of interest which is quite liable to arise between one generation of workers and the next through failure to maintain a continuous development of students and others interested in the Academy and other scientific work.

Professor J. F. Kemp spoke of the Academy as being the fourth scientific organization in the United States in point of age, and dwelt upon the fact that a sentimental appeal of such antiquity was very strong to many and ought not to be overlooked. Specialists ought, once in a while, to be willing to give popular résumés of the progress of science for the benefit of the general membership of the Academy. The general meeting ground of the Academy is a most excellent feature and is of advantage in developing the specialties. The speaker would, however, continue sectional meetings and strengthen the social features through the occasional serving of refreshments and other social activities. The Porto Rico plan appealed strongly to him because he thought it a good field in the various natural sciences. The plan proposed by Professor Britton was one well worthy of consideration. The old name of the Lyceum of Natural History, he thought, had an attractiveness that did not seem to be as strong in the present name of our organization. In the mind of the speaker there did not seem to be any reason for discouragement as to the condition of the Academy or its future.

Dr. Clark Wissler spoke of his first visit to the Academy meetings when he was a university student and of the profound impression that was made upon him as to the serious and elevated character of the papers and their discussions. He said that the effect was stimulating intellectually. The adjourning of the meetings to a near-by café was perhaps even more inspiring, through the familiar conversation and discussion that took place, and this would suggest the desirability of adding occasional social features to the meetings of the present day. Dr. Wissler considers the present meetings of the Academy as, on the whole, successful, for they are organized by specialists to meet their particular needs and the number of such specialists attending is all that can be expected. He believes that no form of meeting can be devised that will meet the needs of specialists and laymen alike.

Professor C. P. Berkey called attention to the two classes of attendants that make up the audience for the regular meetings of his section. First, students of geology and mineralogy, or men intimately connected with this science or people well prepared to understand the more technical papers presented. Second, the non-technical people who are present because of general interest in the subject or in the particular papers offered, or beginners who are prepared to understand all papers except

those of specialists. He suggested that meetings might easily be arranged so that the more technical papers would come together, and that certain meetings in such case should be devoted to and arranged for the professional geologists or the advanced students. On the other hand, papers of a more general character—those of local interest and those of such nature that the average attendant would find them interesting—might be grouped together; and an occasional meeting should therefore be arranged for a more general audience. In announcing a programme this distinction might well be emphasized and an effort made to secure a wider attendance for the general programme.

In connection with the latter type of programme it was suggested that it would be a good plan to make special effort to reach the pupils in the city high schools and in the colleges where geology, mineralogy and geography are taught and to arrange for representatives of different classes to attend. It was thought that in this way the Academy might be in part an educational center and that it would be the means of disseminating a knowledge of the work of local scientific men and the influence of those who present papers of a general character. The Academy would thus reach early the young people of the city who are finally to be its main support.

A unit piece of research work such as has been suggested by Professor Britton is undoubtedly an excellent suggestion.

Dr. F. A. Lucas: The Academy seems to be suffering from a complication of disorders. Some of the work of academies has been taken up by special institutions, for example museums. An affiliated society might be combined with the corresponding section of the Academy or even take its place. Some branch of research would be a good point of concrete attack for Academy activities. The meeting room at the Museum is about as good as any that one finds assigned to academies of sciences. The publications should be actively kept up. It may be desirable to condense the sections or reduce their number.

Professor C. C. Trowbridge would offer general meetings of the whole Academy occasionally. He would specially urge the policy of having "Recent Progress of Science" talks among the different branches of activity and would publish a very brief outline of these lectures in the *Bulletin*. He also suggests that it might be possible to split up the Annals into different series for the different sciences.

Professor R. S. Woodworth: The Academy should act as a central bureau for the co-ordination of special scientific societies, and committees for the several sciences, charged with the task of getting up meetings, should take the place of sectional officers. The independent tech-

nical societies in the city should be drawn into close affiliation with the Academy, if possible. A concrete object of attack along research lines is good, and it might be advantageous to establish a standing committee on research.

His idea, in other words, is to give up the division into four sections and to have instead a committee on each of the sciences, which, working as far as possible in conjunction with the special society for that science, shall get up popular lectures and semi-popular meetings, as well as, where possible, strictly scientific meetings. There might be eight or ten or more of such committees.

Professor J. E. Woodman: The suggestions made by the preceding speakers are all feasible; nothing is really chimerical. Is in close agreement with the ideas advanced by Professors Kemp, Berkey and Wissler. The present tendency is toward a rather sharp subdivision into professional societies, amateur scientists, students, etc., though at the same time we do not seem to be bringing forward a new set of younger workers that will directly benefit the Academy. Division into sections is considered imperative, at the same time that too much subdivision should be avoided. General meetings have not been over successful, but a series of special talks at irregular intervals is good. The addition of a social feature to some of the meetings is also desirable. The interest in different sciences differs and attendance at the meetings necessarily varies.

Dr. R. W. Tower: The library of the Academy is filling a most important place and the files of the proceedings of sister academies are very important. Before long the disposal of duplicate books and pamphlets will become highly desirable.

Dr. W. K. Gregory: In the Section of Biology at the present time there is very urgent need of new blood. Many of the older and most eminent members of the section, who formerly took a leading part in its scientific meetings, have transferred their activities to other biological societies, some of which are now enjoying an enviable prosperity.

The officers and other members of the section have long struggled against this waning interest: by personal efforts to re-enlist active cooperation and by endeavoring to make the scientific meetings worth while for investigators. Many important and interesting communications have been presented at the meetings, but so far the absentees have not been recaptured.

A new generation of workers must, I think, be enlisted, by inviting the numerous younger students and investigators in this city to participate in the meetings of the section, and by presenting topics in harmony with their interests and needs.

Professor T. H. Morgan: Instead of diffusing itself over as much ground as at present the Academy might well have, say, two general meetings in the course of the year at which the programme might be about as follows: short special address on some topic of particular live interest; a brief interval of time during which the audience would segregate itself into sectional meetings; sectional meetings, with technical programmes; a social hour, with refreshments. Special meetings of sections would be left to committees for organization.

Professor Poor objected to any proposal to dispose of such books as duplicated the library of the American Museum and spoke strongly in favor of maintaining the identity of the Academy's library. He stated that what the Academy needed was an independent home, a house of its own, where members could be surrounded by their own belongings, their books, their scientific relics; that without such a permanent home he feared the Academy would cease to exist, and that if the library was destroyed and relics abandoned there would be no excuse for the future existence of the Academy.

Dr. E. O. Hovey: The success of the Section of Geology and Mineralogy has been due not only to the general public interest in the geographical side, at least, of the science, but also to the live interest that the older geologists have always taken in the Academy and its work, and for the past few years in particular to the energy and enthusiasm of its secretary, Professor Charles P. Berkey. It seems as though a similar combination of elements would lead to success in other sections. Cooperation between sections and correspondingly related societies has worked so well in the Section of Anthropology and Psychology that it seems worth trying in the other two sections that are having difficulties with their meetings. At the present time, the three classes of persons to be depended upon for any organization like ours are provided for with apparent sufficiency as follows: professional workers may be fellows; amateurs and others with a general interest in the maintenance of such an organization may become active members; students and the younger workers may become associate members for a limited time. The Section of Astronomy, Physics and Chemistry now has the privilege of holding meetings on alternate months and the Council might extend this provision if thought desirable. The exclusiveness mentioned by Dr. Southwick has never occurred to the speaker, because we always invite the general public to all our meetings and the invitation seems always to have been accepted whenever the programme carried anything of general interest. When the Lyceum of Natural History was flourishing, it had a building of its own and a museum, but there was no American Museum

of Natural History in existence. The burning of the Lyceum's building and the destruction of its museum paved the way for the establishment of the American Museum. The establishment of special objects for research like the Porto Rico project brought forward by Professor Britton looks very attractive and hopeful. The educational work of the Academy, particularly in the way of keeping the public informed of the activities of the professional members of the Academy, seems highly important. Social features might be added to occasional meetings with apparent advantage. The recent address of Dr. Carrel was an excellent example of a meeting of live interest and the little reception which followed seemed successful.

All the men present having been given an opportunity to express their views, President McMillin called upon Professor Osborn to sum up his impressions of what had been said.

Professor Osborn responded: The most cordial thanks of the Council are due to President McMillin for his generosity and hospitality in providing for this special meeting. As compared with its condition twenty years ago the Academy is really very flourishing, and the statistics which have been submitted by the Recording Secretary show that its circumstances have been steadily improving during the past decade. A specific object of research such as that proposed by Professor Britton would be admirable for its effect upon the scientific world in general and the Academy in particular and seems entirely practicable. Professor Morgan's suggestions as to addresses by distinguished speakers at general meetings is valuable, although it would appear that the rights and expectations of the non-scientific members of the Academy are met by the provision of lectures by great men; for example, the recent lectures of Dr. Alexis Carrel and Professor Hugo de Vries. Sectional meetings might be of two kinds, as follows: First, technical meetings devoted to brief presentations of scientific work strictly limited in time, alternating with meetings of a semi-technical character, with a summary of recent progress in certain branches given by a single speaker.

Professor Britton then took the floor and proposed the following resolutions, which were discussed and upon which action was taken as indicated.

> 1. The general sense of the meeting is that the sections be authorized to omit the monthly meetings at the discretion of the officers and further authorized to segregate into general and special meetings. *Carried.*

2. That the research proposition be referred to a committee representing the various sections to report at the next regular meeting. *Carried.*

3. That an increase in the number of associate members be invited. *Carried.*

4. That a request be made for a close estimate of the expense required to put the Academy room into satisfactory shape. *Carried.*

5. That the Secretary be authorized to arrange for general meetings along lines suggested by Professor Morgan. *Carried.*

6. That the Editor be authorized to segregate the publications into several volumes according to subjects. *Referred to Publication Committee for Report.*

7. That the Librarian be authorized to dispose of duplicates by exchange or sale for the benefit of its library. *Rejected.*

After a cordial informal vote of thanks to the President for his hospitality, the Council adjourned at 11:30 p. m.

E. O. Hovey,
Recording Secretary.

OCCASIONAL PAPERS OF THE NEW YORK ACADEMY OF SCIENCES
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Editor, EDMUND OTIS HOVEY

IS THE NEW YORK ACADEMY OF SCIENCES AN EFFICIENT ORGANIZATION?

BY

EMERSON McMILLIN

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IS THE NEW YORK ACADEMY OF SCIENCES AN EFFICIENT ORGANIZATION?

By Emerson McMillin

(*Presidential Address, Read at the Annual Meeting of the Academy, 16 December, 1912*)

At the October Council meeting this year, the efficiency of the work of the Academy was challenged. This resulted in the officers of the several sections and of the Affiliated Societies being requested to make reports to the regular November Council meeting.

When the reports were presented, it became apparent that the questions raised were important enough to warrant holding a special meeting for their consideration; such meeting was held on November 19th.

The meeting was called for six o'clock p. m. and remained in session until nearly midnight. During the session some three and one-half or four hours were consumed in continuous discussion of the questions presented by the reports. I mention this as an evidence of the earnestness of your officials.

The minutes of that meeting would interest you quite as much and, possibly, would enlighten you more than what I will say to you. I would take the liberty of incorporating the minutes in my remarks, but for the fact that your Council has wisely ordered that they be printed in pamphlet form and a copy sent to each member.

The evening's long discussion made it apparent that the Academy is deficient in many ways; all, however, susceptible of correction.

Though strong in years of experience, and with a large and intelligent membership, still it is considered by some, who are competent to have an opinion, that the Academy is not as efficient as it was many years ago.

If this opinion is well founded, it indicates a lamentable lack of interest, or an excess of bad management. Is the Academy retrograding? Only the older members can answer that question.

In an address delivered ten years ago by the then president, the Academy was characterized as an atrophied body. One who was president eleven years ago gives it as his opinion that the Academy never did more efficient work than now, nor had as brilliant prospects as at the present time.

One who has been a member long enough to have presented and read a paper forty years ago says that the attendance at meetings now and the interest manifested are much the same as in the past.

Some of the old and observing members attribute the absence of interest to the division of the Academy into sections. This, however, was not an experiment with our Academy. The Academy of France so divided its work in the time of the "Grande Monarque." Such division is almost the universal rule with European academies.

After much talking with members, I am impressed with the belief that a very large majority favors a continuance of the present arrangement.

Many members think our technical papers are generally too long. I am thoroughly grounded in that belief. If two hours are to be devoted to our evening meetings, not more than forty minutes, as a rule, should be given over to the reading of papers, and never more than one hour. The remaining time should be devoted to a discussion of the papers. This to obtain, however, after the defects in the acoustic properties of the room in which we hold most of our meetings shall have been corrected.

Some think we have too many meetings. That is possible, but I believe not probable. I cannot see how the frequency of meetings can be detrimental, except, possibly, by overworking a few enthusiastic members.

One of the old world academies, Stockholm, I believe, holds meetings so frequently that it is deemed advisable for them to publish their proceedings and papers quarterly.

I doubt if our audiences would be larger if the meetings were but half so frequent. Can we find subjects of interest that will attract audiences to our sectional meetings as often as now provided for? Experience of other societies should afford us some light on this question.

It was my good fortune to be one of the organizers of a small scientific society more than a third of a century ago, which held fortnightly meetings from October to June. The membership never exceeded twenty-five. The members read papers in the alphabetical order of their names, and, while the general subject was named by the society, the speakers were required to give two weeks' notice of the particular phase of the general subject they would present. The other members were to be prepared to discuss the paper.

It may surprise some of you to hear that "Iron" afforded a subject for several years' discussion. "Iron," its possible origin; the deposit of its oxides; its mining; transportation; treatment previous to its smelting. (Local deposits were limonites and carbonates.) Its smelting; its pud-

dling; its rolling into slabs; its reheating and its rolling into available shapes. Germane to this were the origin, deposit, mining and transportation of coal for fuel; the deposit, mining and transportation of limestone for flux.

The general subject permitted papers on speculative, applied and exact sciences. The theorist, the geologist, the mining engineer, the railroad engineer, the chemist and the metallurgist—all had a broad field for a display of knowledge in their respective lines in the discussion of that one general subject.

One member, who was much devoted to astronomy, presented a paper with an interesting, if not a direct, bearing on the subject. He was able to demonstrate quite clearly that up to that time (during the 70's) there had been cycles of high prices for pig iron; that these cycles reached their zenith about every eleven years, and that they were coincident with the periods of greatest solar disturbances.

That the Academy's usefulness and efficiency are not in consonance with its opportunities and possibilities is almost unanimously conceded by those familiar with its resources and with what it accomplishes or fails to accomplish.

The many hours of discussion at the November special meeting of the officials of the Academy uncovered many of the weak points, yet failed to show any evidence of any antagonism, cavil, bickering or any tendency of the members to separate into cliques. On the contrary, there were many evidences that all are loyal well-wishers of the Academy. Some are pessimistic, some optimistic and some entertain neutral views. I fear, however, enough interest has not been awakened in the majority to induce the formation of an opinion on the question of *efficiency*.

Doubtless there are members in each of the sections who are pessimistic to a degree that warrants them in refraining from active work, yet that feeling has been dormant, or held in abeyance, in all sections, save one—Astronomy, Physics and Chemistry. The chairman of that section has suggested that it be permitted to disband. This because the Physicists Association and the Chemists Club are drawing to those organizations the active workers in those two sciences, and there are not a sufficient number of astronomers in the city to maintain the work of that section.

The sciences included in the work of all the sections are of vast importance; but to me, personally, the work covered by this particular section seems of transcendent importance.

I trust that I may be pardoned a personal reference. I feel it will not be entirely out of place to say that I attribute what little success I have

achieved in life largely to the fact that for a score of years the most of my nights from eight o'clock until midnight, and not infrequently beyond that hour, were passed in my chemical laboratory.

If a young man of ambition can find time for the study of but one of the sciences, let it be chemistry.

At the present time no manager of any branch of the manufacturing business can approach perfection without a knowledge of the fundamental laws of chemistry. In fact, he cannot be the most competent manager of a great railroad system without a knowledge of chemistry; the same may be said of one who desires to become a great lawyer; and such knowledge is indispensable to the intelligent practice of medicine. The engineer of mines must necessarily be a chemist, and, if he includes in his profession that of metallurgy, such knowledge is everything to him. The purity of the water we drink, and even the air we breathe, must often be vouched for by the chemist.

The great improvement in agriculture during the last two decades is due almost wholly to the work of the chemist. The cost of living is high now, but how much higher it would be without the labor of the chemists can hardly be estimated.

Chemistry enters into the production of nearly everything we buy, and always tends to lower the cost of production. The labor and brains of the chemists add hundreds of millions annually to the wealth of the world.

The subject of physics is too broad and dovetails into too many other branches of science for a cursory reference to the great value of a knowledge of the sciences covered by that caption.

While I mention astronomy last, it is the first and the most intensely interesting of all the sciences, and the one, it seems to me, that could be most effectually used in our public meetings for awakening an interest in the work of the Academy. In many phases of the science it is exact in the fullest sense of the word. In others it is theoretical and wholly speculative. I wish I could devote all my waking hours to the study of astronomy.

I do not doubt that with a little extra effort at first the largest hall in the American Museum of Natural History could be filled once a fortnight for eight months in the year with an intelligent and interested audience to listen to lectures on astronomical subjects.

Had I not thought it a duty to talk to you on the internal affairs of the Academy, I would have been tempted to put on record at this time some of the views of a layman on a few of the mooted questions, and even on some of the accepted theories of this great underlying and overshadowing science.

The members of the Academy would doubtless find it entertaining and instructive did they give the chairman of the Astronomy, Physics and Chemistry Section encouragement by their presence at its meetings. With such interest manifested, this section would soon be (what the officers are capable of making it) the most useful and the most interesting of all the sections, viewed from the standpoint of applied science, or as presenting the most profound of all subjects for study that can engage the human mind.

If not to exceed twenty per cent. of our members can do even passably well, then what splendid and efficient work we could do if the other eighty per cent. could be stimulated to take even the interest the twenty per cent. evinces at present.

Careful inquiry fails to disclose any abnormal conditions that seriously militate against the efficiency of our Academy. Taking all conditions into consideration, if the Academy is not as useful as it should be, the trouble is inherent.

Are the members void of that enthusiasm essential to the evolution of interested and industrious workers? Are we lacking in that inspirational éclat that should permeate the membership of this Academy? If so, this is not a fault, only a misfortune, for which the management must be largely responsible.

Scores and hundreds of academies existed before ours became an entity. Some of them were organized centuries ago—and with different ends in view. Some have been created for the glory of their founders; many for the glory of their royal patrons. Some were established for the advancement of philosophical knowledge; others for the purification of the language of the academy's country. Some were erected for the encouragement of poetry and dramatic art. Some to create or evolve inscriptions and designs for medals and coins and for decorations to be conferred on royal favorites; others were created for the improvement of literature and some for the study and advancement in a knowledge of the sciences.

In a few instances these organizations grew into recognized academies without being originally so designed. It is not improbable that we shall see an exemplification of this in our own country and city. The strong, enthusiastic and, even now, notable organization, "The Camp Fire Club of America," is unconsciously growing into an academy for awarding "honor" and "high-honor" medals for feats of courage, endurance, wisdom, exploration, conservation of animal life and forest, unusual knowledge of nature, astronomical knowledge, production of nature books of value and for scores of achievements worthy of commendation. Its

medals are sought after and highly prized, especially by the authors of books. The club has, after years of careful investigation, established honor standards for the guidance of its members. Its medals, however, are awarded to outsiders for like achievements. I am familiar with the work of the Camp Fire Club and know of the wide influence it is wielding, and it is, in my opinion, doing more good and efficient work today than any other organization of which I have knowledge.

Most of the earlier academies were supported by the civil governments. These always had a membership limited to a small number of persons. The great Charlemagne established an academy in which all the members were required to assume the name of some distinguished person of ancient times. This was to remove cause for embarrassment that might otherwise result from differences in civil, military or social rank. The members were not inappropriately called "Ancients." This designation held good in France until abolished by Louis XIV, at which time he designated the members "Professors."

Whether the academies were supported or controlled by the governments, or whether they were self-sustaining, in one respect they were alike; they all had troubles of their own. Most of them were useful for but a short time. Others, generally through or after one or more reorganizations, have been and still are powers for much good; especially do they confer great honor on their members.

During the reign of Katherine II, the Academy of Sciences of St. Petersburg became practically a society for exploration and research and was of recognized value to the government and to the country. This is in line with the suggestion made by one of our ex-presidents. The special committee to which his suggestion was referred has reported and in effect endorses the suggestion, but wisely advises caution and further consideration.

Our own Academy was created (if it did not simply grow) for discussion and encouragement in the study of the sciences.

Unlike many of the academies preceding ours, we are not hampered by government red tape. We are free to elect or reject applicants for membership. We have absolute self-control. We elect as our officers and as our legislative and executive council those whom the members choose to honor and entrust with the management of the Academy's affairs. We adopt our own rules. We are not embarrassed for lack of funds. We are amply supplied for present needs, and there is no good reason to doubt that more funds might be readily obtained did the necessity arise.

The Academy of Sciences is not, in itself, properly equipped for the most efficient work. It is rather a directing body; a nucleus about which are grouped minor and auxiliary organizations devoted to the study of nearly all branches of the sciences.

The Academy occupies an exalted and dignified position in relation to other scientific bodies of this country and, in some degree, to those abroad. While it is not venerable in years, it has, under its present and previous designations, almost reached its first century time-post. It is old enough and strong enough to be self-supporting, though it finds it convenient and advisable to live in the home of its giant younger sister, The American Museum of Natural History.

What should be our chief aim? What end should we strive to obtain? I answer

> *First:* An improvement in the knowledge of the sciences by our members.
>
> *Second:* To aid in the advancement of scientific knowledge generally.

The opinion is frequently and rightfully expressed that students, in or out of school, should enlist a large part of our thought in the preparation of papers for our meetings. Men of middle age and of maturer years are not easily influenced by listening to the reading of a paper, especially if it is along the lines of their teaching or of their professions. Such members can readily and much more easily turn to the shelves of their libraries and take up the latest work on the subject, treated by unquestioned authority.

Almost infinite good, however, may be instilled into the young and receptive mind by listening to the reading of a carefully prepared paper, whether technical or general in character.

At a recent meeting of your Council, a suggestion was made that the sections alternate between papers of a general scientific character and technical productions. The suggestion was unanimously approved.

We are having to contend with a hindrance to progress in the work of the Academy through the rapid growth of interest in the industrial sciences. Nearly every branch of our large industries now has an organization composed chiefly of managers, engineers and experts in that special line. Iron and steel, electricity, mining, gas, fertilizers and scores of other industries; all of these have ceased to be operated by the rule of thumb. They are managed by scientific experts in each particular line. These men generally prefer to devote such time and energy as can be spared from routine work to the production of papers for their

own organizations rather than for a society whose members, however thorough in the technical sciences, lack the practical experience to enable them to tell these specialists how to reduce operating expenses, or point out the most economic way to increase the output capacity of their respective plants.

To crystallize these thoughts into an available form, pardon a few suggestions that appear to me advisable for future guidance:

1. Retain existing form of organization.

2. Permit greater elasticity in the work of the sections.

3. Permit sections to subdivide their work when they so elect.

4. Authorize sections to meet at such times and places as they shall elect.

5. Advise that each section designate some one (or more) whose special province shall be to visit and talk with students in schools and colleges, as well as with other persons known to be seeking scientific knowledge, and interest them in the Academy work.

6. Encourage occasional discussions of scientific subjects of general interest.

7. Disabuse the minds of members of any feeling that they are members only for the contribution of annual dues. Convince them they are part of the working body and advise that they assert themselves.

8. Request sections to make it a rule that only so much of any paper presented shall be read as will occupy not more than forty minutes in the reading.

9. Make it a rule to publish only that portion of a paper which has been read; but the Academy should typewrite, if so desired, the whole of any paper approved by the publication committee, the manuscript to be filed in the Library of the Academy in a manner to be easily accessible.

10. Strive to increase the membership by interesting selected high school, college and university students, and fix their annual dues at not to exceed $1.00 each per annum.

11. Avoid a general solicitation for membership. Do not make the membership too easy for the adult who is able to pay.

12. Consider well the frequency and character of meetings. I advise that each section have at least one public meeting each year. If found to be necessary, pay the lecturer, using a portion of the money now used in the publication of long papers for lecture purposes.

13. The Academy business meetings ought to be for purposes other than simply approving proceedings of Council. They should not generally be held on the evening of the meeting of some section. They should fill the requirements of those who believes the division into sections is detrimental. The meetings held in the recent past were perfunctory. The attendance at the Academy meetings should be as large as at this annual meeting.

14. Revise the By-Laws, making it possible to invest Academy funds in high-class preferred stocks, instead of low interest-bearing bonds, and thereby increase the income from investments twenty-five to forty per cent. per annum.

15. The Council should appoint a special committee to consider the question of a proper home for the Academy. This much is due to the belief on the part of many members that a home of a different character would add greatly to the enjoyment, as well as to the usefulness of the Academy.

16. A Committee, with full authority, should be appointed to correct the acoustics of the room where our business is now transacted.

17. A Committee, to be partly composed of lady members, should be appointed to report on the advisability of attempting to increase interest in our work by enlarging the social feature, either with or without refreshments.

18. A trial should be made of securing attendance at ordinary sectional meetings, through sending out printed cards with blanks for filling in dates; to send such cards to members only of the section holding the meeting, and to a few others who may be named by the officers of the section or person presenting the paper. It is possible to save several hundred dollars per year in substituting this for the present Bulletin. Whether it will be as effective, only experience can tell.

19. Have the Library Committee report to an early meeting on the question of duplicate volumes, with recommendations.

20. Endeavor to arrange with the Museum authorities for space in the proposed new addition to their building in which to care properly for Academy specimens.

21. Continue to cultivate amicable relations with the American Museum of Natural History, and cause the feeling to become fixed in the minds of the civic authorities and of the public generally, that in considering the welfare of the Museum the existence of the Academy cannot be ignored.

22. Give prompt and serious consideration to the suggestion that the Academy take up special work of scientific interest. The special instance suggested was not only one of scientific interest, but also one of great economic possibilities.

23. Do not invite your friends to the meetings of the sections to be held in our present meeting room until the acoustics have been corrected.

24. Is it not probable that out of this multitude of suggestions, and of the many that will follow these, we can evolve or accomplish results that will, in the not very distant future, entitle the New York Academy of Sciences to be called an efficient scientific organization?

DECEMBER 16, 1912.